

Washington Latin -- Honors Pre-Calculus

Exponential Properties

Remember the equations for growth of money:

A = amount of money you have;

P = the principal or original amount you invested;

R = the annual interest rate;

t = time in years.

Simple interest

$$A = P(1 + tR)$$

Interest Compounded annually

$$A = P(1 + R)^t$$

Interest Compounded n times per year $A = P(1 + \frac{R}{n})^{nt}$

Using the above equations, solve the following problems (you may use calculators but please show enough work so that I can understand what you did).

1. Sally has \$1,000 to invest that she plans to use to buy a house in 5 years. She is considering two investment options: option 1 offers simple interest at 6%, and option 2 offers annually compounded interest at 5.5%. Which is the better option for Sally and how much will she have after the five years?
2. Alexi has \$3,000 to invest. She can invest it in a money market fund which will give a return of 6.3% compounded monthly. She also can put the money in a stock fund that advertises it has earned an average of 6.4% compounded annually. Which is the better option, assuming the stock fund continues to have the same success? How much will she have after 5 years?
3. Big Louis loans money to business associates. He wants to double his money in 3 years. Assuming it is compounded annually, what interest rate should he charge?

Think about this question. Go as far as you can in solving it.
4. How long will it take to double your money if you invest it at a rate of 6.25% compounded monthly?

5. The population of Silver Run was 6,250 in the year 1890, and increased at a rate of 6.25% per year. What will the population be in 1915 and 1940? About when did the population reach 50,000?

6. If we can compound money annually, monthly, weekly, daily, what do you think happens if the period of compounding gets really small? How small do you think it can get?